

REMARKS

Claims 1-17 are pending in the current application. Applicant adds new claim 18 to provide an alternative scope of coverage of Applicant's invention in the claims.

The Examiner objects to the specification due to a minor typographical error on page 6, line 24. Applicant corrects this portion of the specification as shown in the Appendix.

The Examiner rejects claims 1, 2, 9, and 13-17 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,781,085 to Harrison. Claims 1, 13 and 17 are independent claims, with claims 2 and 9 and claims 14-16 dependent from claims 1 and 13, respectively. Therefore, Applicant focuses the discussion of the rejections on the independent claims.

Applicant overcomes these rejections by amending claims 1, 13 and 17 as shown in the Appendix. These amendments recite with particularity elements that were inherent in the original claims.

Harrison does not disclose or suggest all of the features of the invention as claimed in claim 1. For example, one of the features of the invention as claimed in claim 1 is "a filter housing, said housing having at least first and second cavities separated by a cavity wall, said cavity wall running the entire length of the first and second cavities". Harrison does not disclose or suggest this feature. Harrison discloses walls 44a and 44b separating the cavities in which resonators 3 and 4 are located (Harrison, Figure 1 and column 6, lines 25-41; see also Figures 7a-c and 9). However, as Figures 1, 7a-c and 9 clearly show, the walls 44a and b do not run the

entire length of the cavity. Notably, Figure 1 shows that there are gaps I1 and I2 in these walls. Therefore, Harrison does not disclose or suggest this feature.

Claim 13 recites a feature of a cavity filter “including...a cavity wall running the entire length of the first and second cavities and disposed between said first and second resonators”. In addition, claim 17 recites a feature of “a cavity wall running the entire length of the first and second cavities”. These features are similar to the feature of claim 1 discussed above. Therefore claims 13 and 17 are allowable at least for the reasons discussed above with respect to claim 1.

Because Harrison does not disclose or suggest all of the features of claims 1, 13, and 17, these claims are not anticipated by (i.e. are not readable on) Harrison at least for this reason. Claims 2 and 9 and claims 14-16 should be allowable at least by virtue of their dependency on claims 13 and 17, respectively.

The Examiner also rejects claims 1-3, and 9 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,453,146 to Fiedziuszko. Fiedziuszko also does not disclose or suggest all of the features of claim 1. For example, one of the claimed features of claim 1 is “first and second resonators...are coupled to each other by both an adjustable inductive coupler and a capacitive cross-coupler.” Fiedziuszko does not disclose or suggest this feature of the claim. In Fiedziuszko, the inductive coupling between cavity resonators is provided by iris 30 (Fiedziuszko, Figure 1 and column 4, lines 30-41). Fiedziuszko, however, does not disclose that the iris 30 is in any way adjustable. Therefore, Fiedziuszko does not disclose or suggest this feature of the claim.

Because Fiedziuszko does not disclose or suggest all of the features of claim 1, claim 1 is not anticipated by (i.e. is not readable on) Fiedziuszko at least for this reason. Claims 2, 3, and 9 are allowable at least by virtue of their dependence on claim 1.

The Examiner rejects claims 4-8 and 10-17 under 35 U.S.C. § 103(a) as being unpatentable over Fiedziuszko in view of Harrison. Applicant traverses this rejection by arguing that it would not have been obvious at the time of the invention to combine the references as the Examiner alleges.

The Examiner acknowledges that Fiedziuszko does not teach or suggest inductive tuning (e.g. claims 4, 13, 17) that affects the capacitive coupling and that Fiedziuszko does not explicitly state that 3rd and 4th resonators are inductively coupled (e.g. claim 12). The Examiner alleges that it would have been obvious to one of ordinary skill in the art at the time of the invention to have added tuning as taught by Harrison, using a threadedly engaged tuning screw in either the cover or side wall to affect the inductive coupling and thus the capacitive coupling, to the filter of Fiedziuszko because such a modification would have been considered a mere substitution of art-recognized equivalent filter tuning means. Applicant respectfully disagrees.

Neither reference suggests such a combination, nor do their disclosures motivate it. In fact, Fiedziuszko discloses that the capacitive coupling can be changed simply by removing probe 22 and replacing it with another probe of different length (Fiedziuszko, column 4, lines 42-56). Because the capacitive coupling in Fiedziuszko can be changed directly by replacing the

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capacitive couple probe 22 with another of different length, one would have no motivation to combine a tuning means such as that found in Harrison to alter the capacitive coupling indirectly.


Furthermore, it is not obvious that the tuning means of Harrison is combinable with Fiedziuszko at all. In particular, Fiedziuszko is designed in such a way that the inductive coupler iris 30 is disposed in the cavity wall beneath the capacitive coupler (Fiedziuszko, Figure 1). Given the shape of the cavities 12 and the dimensions of the cavity walls 40, it is not obvious where a screw could threadedly engaged through either the cover or side walls 40 such that it could penetrate into the iris 30. To accomplish such a combination would either render the current design of the filter of Fiedziuszko inoperable, or would require a substantial redesign of the filter involving further experimentation and testing. At least for these reasons, one of ordinary skill in the art would not have been motivated to combine the references in the manner suggested by the Examiner. Therefore, the rejection of claims 4-8 and 10-17 under § 103(a) is traversed.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned attorney at the telephone number listed below.

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

The paragraph beginning on page 6, line 24 is changed as follows:

“Referring to Figure 232, the filter cover 104 encloses the resonator cavity. According to the preferred embodiment, the filter cover 104 is made of lead, while the housing 102 is made of iron. Of course, the invention is not limited in this respect. The cross-coupling bar 124 is held in the cavity wall 123 by a collar 138, made of an electrically insulating material such as plastic. As noted above, the tuning screw 1136 extends through the filter cover 104 into the notch 134.

While notch 134 can be of any height equal to or less than the height of wall 123, in the preferred embodiment the notch provides only fine adjustment of the capacitive effect of the cross-coupling bar 124. Therefore, the height of the notch is only between twenty and fifty percent of the height of the wall 123. Again, however, it should be understood that the invention is not limited to any particular height.”

IN THE CLAIMS:

The claims are amended as follows:

1. (Amended) A cavity filter comprising:
a filter housing, said housing having at least first and second cavities separated by a cavity wall, said cavity wall running the entire length of the first and second cavities;
a filter cover for covering said filter housing; and

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a plurality of resonators respectively disposed in said cavities,
wherein first and second resonators, of said plurality of resonators, are coupled to each other by both an adjustable inductive coupler and a capacitive cross-coupler.

13. (Amended) A method of tuning the frequency response of the bandwidth of a cavity filter that includes a filter housing, a filter cover for covering said filter housing, a plurality of resonators respectively disposed in cavities, including a first and second resonator respectively disposed in first and second cavities, a cavity wall running the entire length of the first and second cavities and disposed between said first and second resonators, an inductive coupler that includes a tuner, and a capacitive cross-coupler; said method comprising:

adjusting the capacitive cross-coupling effect between said first and second resonators by adjusting the inductive coupler.

17. (Amended) A method of tuning the frequency response of the bandwidth of a cavity filter that includes a filter housing with a plurality of resonators disposed in cavities, a first and second of said plurality of resonators separated by a cavity wall running the entire length of the first and second cavities, comprising the step of adjusting the capacitive cross-coupling effect between said resonators by externally adjusting the inductive coupling.

New claim 18 is added.